

Such a tree seen as a few top branches should have a very low branch for *Neritilia*, a somewhat higher one for *Smaragdia*, a separate old branch for *Nerita* and higher branches for *Neritodryas*, *Septaria*, *Theodoxus* and *Neritina*. Concealed amidst the top twigs of *Nerita* there might be branches known as *Nerita alticola* and *Nerita pupa* which in reality arose as "water shoots" from the bases of *Theodoxus* and *Neritina* branches and not from *Nerita*.

In time such a tree if well pruned and tended might represent a harmonious expression of facts known as to general anatomy, secondary sex organs, shell form, operculum characters and radula details in this family, Neritidae.

MOLLUSCA FROM PRINCE ALBERT NATIONAL PARK, SASKATCHEWAN

BY FRANK C. BAKER

The portion of Canada known as Saskatchewan is little known conchologically and additions to our knowledge of the mollusk fauna of this region are greatly to be desired. With the exception of two or three papers the only references to this region are contained in general papers on Canadian Mollusca or in descriptions of new species. During the summer of 1936, Professor T. D. A. Cockerell, of the University of Colorado, made a collection of Mollusca from several of the lakes in Prince Albert National Park near the center of Saskatchewan, at about 54 degrees of latitude. Professor Cockerell requested the writer to prepare a list of the species represented and the following lists indicates that the collection is unusually extensive.

Nine species of land mollusks and 21 species of aquatic mollusks are contained in the collection. The fauna is characteristically that of the northern part of the United States and southern Canada, quite different from the molluscan fauna of the Rocky Mountain region. It is more eastern than western, a feature also noted among certain insects and arachnids collected (see Cockerell, Canadian Ent., 68, p. 85, 1936). The avian and mammalian faunas are also of this nature. The land snails are such as are common in the northern part of the United States, all of

the species being recorded from northern Minnesota. The aquatic fauna contains several species apparently peculiar to Canada east of the Rocky Mountains previously known from Alberta and southern Saskatchewan. Thus *Stagnicola johnsoni* is known from parts of Alberta. The presence of *Gyraulus hornensis*, a recently described Canadian species, is also noteworthy. The record of *Helisoma infracarinatum* also indicates a wide range of this recently recognized species. Some other species are equally interesting from a distributional standpoint. Prince Albert Park lies mostly in the Canadian zone and the molluscan fauna is typical of this climatic division.

Little work has been done on the Mollusca of this region and rich results await the naturalist who can collect material from the many lakes in northern Saskatchewan. Studies such as were conducted on Oneida Lake, N. Y., and Winnebago Lake, Wis., would be of the greatest interest. Dredgings in these lakes are highly desirable as well as careful littoral collecting. The Canadian conchologists have a rich field for their labors. The collection of Professor Cockerell is the largest single lot of molluscan material seen from this interesting region. The writer wishes to express his thanks to Professor Cockerell for the privilege of working up this interesting material and to Dr. Wm. J. Clench, of the Museum of Comparative Zoology, Harvard University, for the identification of the Physae.

Anodonta kennicottii Lea. Ajawaan Lake, adult and immature. All of the specimens of this species are characterized by a corneous or yellowish shell.

Pisidium species. Ajawaan Lake; Waskesiu Lake; Waskesiu Lake at Heart Lakes Portage; south end Crean Lake. At least four species are represented but it seems unwise to attach names to them. It is unfortunate that no one has taken the place of Dr. V. Sterki in the study of these interesting but difficult mollusks.

Valvata tricarinata (Say). Waskesiu Lake; Waskesiu Lake at Heart Lakes Portage; south end Crean Lake. Typical form with three well defined, sharp keels.

Valvata sincera Say. Waskesiu Lake and Waskesiu Lake at Heart Lakes Portage. These specimens agree well with examples

from High Island Harbor, Lake Michigan, identified as *sincera* by Dr. Bryant Walker. The Heart Lakes Portage specimens are a trifle more depressed but have the same general form and sculpture.

Amnicola limosa porata Say. Waskesiu Lake and Waskesiu Lake at Heart Lakes Portage. There is great variation in the form called *porata*, from the central west and Canada, and it is quite likely that one or more races may be separated when a careful study is made of abundant material covering a wide area.

Lymnaea stagnalis lillianae F. C. Baker. Waskesiu Lake; Ajawaan Lake; Crean Lake; Waskesiu Lake at Heart Lakes Portage. The large *stagnalis* of the Park is referable to this race rather than to *wasatchensis* Hemphill which occurs in lakes in Alberta, particularly in Wainwright Park.

Stagnicola palustris elodes (Say). Waskesiu Lake; Kingsman Lake; Crean Lake. The *palustris* of the Park are nearer the *elodes* form than the *nuttalliana* form, although the latter is found abundantly in Alberta in Wainwright Park. The Prince Albert Park specimens may be considered transitory forms between the eastern and western race.

Stagnicola johnsoni F. C. Baker. Ajawaan Lake. The single specimen in the collection resembles specimens from Banff, Alberta, referred to *Lymnaea traskii* Tryon in the Lymnaeidae monographs (see plate 39, fig. 10 of that work). It is larger than any specimen seen, measuring 26 mm. in length and 14 mm. in width. The Alberta reference to *traskii* was erroneous, that species not being found east of the Rocky Mountains. *Johnsoni* was described in the Canadian Field-Nat., 48, p. 69, 1934. This species is probably widely distributed in central Canada.

Fossaria obrussa decampi (Streng). Crean Lake, typical in form but small in size.

Helisoma anceps sayi (F. C. Baker). Waskesiu Lake; Waskesiu Lake; Waskesiu Lake at Heart Lakes Portage; Crean Lake. This race of *anceps* is apparently common in the lakes of the Park. The Heart Lakes Portage specimens are especially large and fine.

Helisoma trivolvis macrostomum (Whiteaves). Ajawaan Lake. A single specimen of large *Helisoma* is apparently referable to the northern race. It is not *subcrenatum*.

Helisoma infracarinatum F. C. Baker. Waskesiu Lake; Waskesiu Lake at Heart Lakes Portage; Kingsman Lake; Crean Lake. The specimens are like the types from Basswood River Rapids, Ontario.

Menetus exacuouus (Say) and *Menetus exacuouus megas* (Dall). South end Crean Lake. The form with sharply 'pinched' periphery, called *megas* by Dall, occurs in many lots from northern localities and perhaps should be considered only a 'form' of *exacuouus* and not a distinct race.

Gyraulus deflectus obliquus (DeKay). Waskesiu Lake (rare); Waskesiu Lake at Hearts Portage (rare); Crean Lake (common). The specimens are for the most part rather large and quite typical of this race of *deflectus*. *Obliquus* appears to be widely distributed throughout Canada and the northern part of the United States.

Gyraulus hornensis F. C. Baker. Crean Lake, apparently common. See the Canadian Field-Nat., XLVIII, p. 135, fig. A, 1935, for a description and figure of this species. This small planorbid appears to be common over much of the Canadian region.

Gyraulus altissimus (F. C. Baker). Waskesiu Lake. The specimens are white and bleached and may have been washed from a fossil (Pleistocene) deposit. The species is abundant in the fossil faunas of Canada and the United States but its status as a living member of the fauna is not well known.

Physa gouldi Clench. Crean Lake; Ajawaan Lake. The specimens of this species, identified by Dr. Wm. J. Clench, have a somewhat longer spire than the type figured by Dr. Clench (Nautilus, 48, pl. 7, fig. 5) but are well within the range of variation of the species. The record extends the distribution well to the north. A large series of Physae from the lakes of this region would be of value to determine the range of variation of this species and also to establish the possible presence of other species.

Euconulus fulvus (Müller). Between Kingsmere and Waskesiu lakes. Typical.

Vitrina limpida (Gould). Ajawaan Lake. Two specimens rather small.

Retinella binneyana (Morse). Ajawaan Lake. Rather small.

Zonitoides arboreus (Say). Between Kingsmere and Waskesiu lakes. Typical.

Discus cronkhitei (Newcomb). Crean Lake. Typical.

Discus cronkhitei anthonyi (Pilsbry). Ajawaan Lake. The periphery is bluntly angular but it is apparently not the race *catskillensis*.

Cochlicopa lubrica (Müller). Between Kingsmere and Waskesiu lakes. Typical.

Succinea retusa Lea. Ajawaan Lake. One specimen, typical.

Deroceras campestre (Say). Ajawaan Lake. One specimen, rather small but a form of this species.

CIVILIZATION AND LAND MOLLUSKS IN OHIO

BY A. F. ARCHER

In 1911 Victor Sterki published in the NAUTILUS, Volume 23, pp. 98-101, a paper entitled "Civilization and Snails." In this paper he compared the present condition and abundance of land and fresh-water mollusks with the conditions which obtained fifty or seventy years previously. He referred to the changes produced by deforestation and cultivation, stating that at the time of writing there was in Ohio only about ten or twenty per cent of the number of mollusks that had formerly inhabited the area a half century before. Furthermore, he stated that there were exceptions in the case of some nine species that had actually been benefited by the changes wrought by the white man.

In the light of present-day conditions, Sterki's presentation of the case seems to suffer definitely from under-statement. This is rather surprising from two points of view. First of all, Sterki was a very careful observer, and secondly, it does not seem possible that there have been any great changes within the last twenty-five years. At any rate I have found a rather different situation within the last few years. With this very problem in mind I have made observations on the Ohio land mollusks during four collecting trips undertaken since 1932, and these observations have been further corroborated by work done in the neighboring portions of Michigan.

